World Markets Research Centre

The first annual survey of government websites conducted by World Markets Research Centre and Brown University, USA

EXECUTIVE SUMMARY

E-government refers to the delivery of information and services online via the internet. Many governmental units across the world have embraced the digital revolution and placed a wide range of materials on the web, from publications to databases. Since global e-government is still in its infancy, it is a perfect time to measure the extent of web service delivery and compare differences that exist throughout the 196 nations of the world.

In this report, we study the features that are available online at national government websites. Using a detailed analysis of 2,288 government websites in 196 nations, we measure the information and services that are online, chart the variations that exist across countries, and discuss how e-government sites vary by region of the world.

In general, we found that e-government is falling short of its true potential. While some countries have embraced e-government, a number of other countries have not placed much information or services online, and are not taking advantage of the interactive features of the internet. Countries with limited wealth and with populations that do not make much use of the internet generally do not have very strong e-government sites. We also document problems in the areas of privacy, security and special needs populations, such as the handicapped, that need to be addressed. We close our report by making several practical suggestions for improving the delivery of government information and services over the internet.

Among the more important findings of the research are:

1) English has become the language of e-government. Some 72% of national government websites have an English version, while only 28% do not.

2) 45% of sites are multi-lingual, meaning that they offer two or more languages.

3) 6% of websites feature a one-stop services "portal" or have links to a government portal.

4) 8% offer services that are fully executable online.

5) The most frequent services involve ordering publications online, buying stamps and filing complaints.

6) 71% of websites provide access to publications and 41% have links to databases.

7) 6% show privacy policies, while 3% have security policies.

8) Only 2% of government websites have some form of disability access (i.e., access for persons with disabilities).

9) Countries vary enormously in their overall e-government performance based on our analysis. The most highly ranked nations include the US, Taiwan, Australia, Canada, the UK, Ireland, Israel, Singapore, Germany and Finland

10) There were major differences in e-government performance based on region of the world. In general, countries in North America, Europe, Asia and the Middle East rank more highly than those in Russia and Central Asia, South America, Pacific Ocean islands, Central America and Africa.

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A NOTE ON METHODOLOGY

In our analysis of websites, we looked for material that would aid an average citizen logging onto a governmental site. This included: contact information that would enable a citizen to find out who to call or write to at an agency to resolve a problem; material on information; services and databases; features that would facilitate e-government access by special populations such as the handicapped and non-native language speakers; interactive features that would facilitate outreach to the public; and visible statements that would reassure citizens worried about privacy and security over the internet. During the course of our study, we looked at a wide variety of political and economic systems, from monarchies, federal systems and presidential democracies to parliamentary systems, dictatorships and communist countries. In each system analysed, we employed the same type of criteria in order to be able to compare the results across countries.

The data for our analysis consisted of 2,288 national government websites for the 196 nations around the world. Among the sites analysed were those of: executive offices (such as a president, prime minister, ruler, party leader or royalty); legislative offices (such as congress, parliament or people's assemblies); judicial offices (such as major national courts); cabinet offices; and major agencies serving crucial functions of government, such as health, human services, taxation, education, interior, economic development, administration, natural resources, foreign affairs, foreign investment, transportation, military, tourism and business regulation. Websites for sub-national units, obscure boards and commissions, local government, regional units and municipal offices were not included in this study. The analysis was undertaken during summer 2001 at Brown University in Providence, Rhode Island.

In general, we found different numbers of websites in each country. Based on our research, there are a number of countries that have 1-4 sites, another group that has 5-10, a third group that has 10-20 sites, a fourth group that falls within the range of 20-30 sites, and a small number that have more than 30 sites. We analysed a range of sites within each country in order to get a full sense of what is available in particular nations.

The regional breakdowns for the websites we studied were 25% from Western or Eastern European countries, followed by 18% from Africa, 14% from Asia, 9% from Central America, 8% the Middle East, 7% Russia and Central Asia (such as the areas of the former Soviet Union), 7% South America, 7% Pacific Ocean countries (meaning those off the continent of Asia) and 5% North America (which included Canada, the US and Mexico).

National government websites reflected the social, economic, political and religious background of that area. Muslim countries often had links to religious unity pages or offered for a where visitors could discuss religious issues. In some former communist nations, ministries of privatisation aimed at foreign investors appeared to be the most elaborate sites. Nations that relied heavily on tourism (such as those in the Caribbean or Pacific islands) often centred their e-government activities around tourism sites.

Regardless of the type of system or cultural background of a country, websites were evaluated for the presence of 28 features dealing with information availability, service delivery and public access. Features assessed included: type of site; name of nation; region of the world; office phone number; office address; online publications; online database; external links to non-governmental sites; audio clips; video clips; non-native languages or foreign language translation; commercial advertising; user payments or fees; subject index; handicap access; privacy policy; security features; presence of online services; number of different services; links to a government services portal; digital signatures; credit card payments; email address; search capability; comment form or chat-room; broadcast of events; automatic email updates; and having an English version of the website.

For e-government service delivery, we looked at the number and type of online services offered. Features were defined as services only if the entire transaction could occur online. If a citizen had to print out a form and then mail it back to the agency to obtain the service, we did not count that as a service that could be fully executed online. Searchable databases counted as services only if they involved accessing information that resulted in a specific government service response.

Where national government websites were not in English, our research team employed foreign language readers who translated and evaluated national government websites where possible. In some cases, we have made use of foreign language translation software available online through http://babelfish.altavista.com. The remainder of this report outlines the detailed results that came out of this research.

OVERVIEW OF GLOBAL E-GOVERNMENT

Several general patterns stand out in the study of e-government. The most noteworthy feature is the extent to which English has become the language of global e-government. Some 72% of national government websites have an English version of the site, while 28% do not. Reflecting the multi-linguistic nature of global interactions, many nations offer more than one language on their websites. For example, almost half (45%) have two or more languages on their government sites. Other than English, common languages included Spanish, French, Russian, German, Italian, Portuguese, Arabic and Chinese.

In terms of information availability, many countries have made considerable progress in putting publications, forms and databases online for citizen access. Government agencies have discovered that it is very efficient for the general public to be able to download common documents rather than having to visit or call the particular agency.

However, many countries have not made similar progress in placing official government services online. There is a wide variation throughout countries and by region of the world in the extent to which citizens can access government services

through the internet. While some governments offer a number of services online, most do not.

Not surprisingly, given this situation, most countries do not have portals that link the services of various agencies and departments of that country. Portals offer many advantages for government offices. Having a single entry point into a national government helps citizens because these portals integrate e-government service offerings across different agencies. Portals reduce the need to log on to different agency websites to order services or find information. Instead, citizens can engage in "one-stop" shopping, and find what they need at a single source. Service portals improve citizen access because they encourage more uniform designs for particular countries. Rather than have a "Tower of Babel" across different government agencies where websites do not share a common navigational system, presentational style or method of organisation, these "one-stop" portals make it much easier for citizens to access online information and services.

Finally, as we discuss later in this report, there remains a need for continuing advancement in the areas of privacy, security and interactive features, such as search engines. Compared to various commercial websites, the public sector lags behind the private sector in making full use of the technological power of the internet to improve the lives of citizens and enhance the performance of governmental units. Given public concerns about privacy and security on the internet, governmental agencies need to do more to reassure the public that e-government is safe and secure for users.

ONLINE INFORMATION

In looking at specific features of government websites, we wanted to see how much material was available that would help citizens contact government agencies and navigate websites. In general, contact information is quite prevalent. The vast majority of sites provide their department's telephone number (70%) and mailing address (67%). This is material that would help an ordinary citizen needing to contact a government agency reach that office. In addition, features such as a subject area index that organise a site and tell a citizen how to navigate the site were abundant. Some 85% of government sites had subject indices.

In terms of the content of online material, many agencies have made extensive progress in placing information online for public access. A total of 71% of government websites around the world offered publications that a citizen could access, and 41% provided databases. Some 42% had links to external, non-governmental sites, to where a citizen could turn for additional information.

Indicative of the fact that global e-government is in its early stages, most public-sector websites do not incorporate audio clips or video clips on their official sites. Despite the fact that these are becoming much more common features of e-commerce and private-sector enterprise, only 4% of government websites provided audio clips or video clips. A common type of audio clip was a national anthem or a musical selection.

Percentage of Websites Offering Publications and Databases

	%
Phone Contact Info.	70
Address Info	67
Links to Other Sites	42
Publications	71
Databases	41
Index	85
Audio Clips	4
Video Clips	4

SERVICES PROVIDED

Fully executable, online service delivery benefits both government and its constituents. In the long run, such services have the potential to lower the costs of service delivery and make services more widely accessible to the general public, because they no longer have to visit, write to or call an agency in order to execute a specific service. As more and more services are put online, e-government will revolutionise the relationship between government and citizens.

Of the websites examined around the world, however, only 8% offer services that are fully executable online. Of this group, 5% offer one service, 1% have two services, and 2% have three or more services. Some 92% have no online services.

North America (including the US, Canada and Mexico) was the area offering the highest percentage of online services, as 28% of sites analysed had fully executable online services. This was followed by the Pacific Ocean islands (19% of which had services), Asia (12%), the Middle East (10%), and Europe (9%). Only 2% of sites in Africa and 2% in Russia/Central Asia offered online government services. Some 3% of sites in South America had online services, as did 4% in Central America. Pacific Ocean islands did well on services mainly because of their efforts to promote tourism.

Percentage of Government Sites Offering Online Services by Region of World

Region	%
North America	28
Pacific Ocean Islands	19
Asia	12
Middle East	10
Europe	9
Central America	4
South America	3
Russia/Central Asia	2
Africa	2

There is a great deal of variation in the services available on national government websites. The most frequent services found included ordering publications online, buying stamps and filing complaints. Several countries had novel online services. For example, the Dominican Republic's National Drug Control office had a "drug information" link in which anonymous citizens could report illegal drug dealing. Australia offered the possibility of applying for jobs online at some national agencies. Bangladesh's National Tourism Organisation offered online booking of hotel rooms. Canada offers a number of services online such as change of postal address forms, package tracking and ordering stamps. Egypt allows for personal and union registration online at the Ministry for Manpower and Emigration. Lithuania offers searches for stolen vehicles, invalid identity documents, and wanted persons through its Ministry of the Interior.

One of the features that has slowed the development of online services has been an inability to use credit cards and digital signatures on financial transactions. On commercial sites, it is becoming a more common practice to offer goods and services online for purchase by credit card. However, of the government websites analysed, only 1% accepted credit cards and 0.2% allowed digital signatures for financial transactions. Among the sites having a capacity for digital signatures were the Taiwanese governmental portal and Ireland's Revenue Department. Since some government services require a fee, not having a credit card payment system makes it difficult to place government services that are fully executable online.

Percent of National Sites Offering Online Services

Country	%
Taiwan	65
Germany	59
Australia	50
Cook Islands	50
New Zealand	48
Singapore	47
Seychelles	40
Canada	34
US	34
Bahamas	33
UK	30
Israel	27
China	26
France	25
Jamaica	25
Liechtenstein	20
Barbados	20
Spain	17
Malaysia	16
Austria	15
Switzerland	15

SERVICES FOR TOP NATIONS

Of the 196 nations analysed, there is a wide variance in the percentage of government sites with online services. Taiwan is first, with 65% of its websites providing some type of service, followed by Germany (59%), Australia (50%), Cook Islands (50%), New Zealand (48%) and Singapore (47%). It is important to bear in mind that our definition of services included only those services that were fully executable online. If a citizen had to print out a form and mail or take it to a government agency to execute the service, we did not count that as an online service.

PRIVACY AND SECURITY

The unregulated and accessible structure of the internet has prompted many to question the privacy and security of government websites. Public opinion surveys place these areas near the top of the list of citizen concerns about e-government. Having visible statements outlining what the site is doing regarding privacy and security are valuable assets for reassuring a fearful population and encouraging citizens to make use of e-government services and information.

However, few global e-government sites offer policy statements dealing with these topics. Only 6% of examined sites have some form of privacy policy on their site, and 3% have a visible security policy. Both of these are areas that government officials need to take much more seriously. Unless ordinary citizens feel safe and secure in their online information and service activities, e-government is not going to grow very rapidly.

SECURITY FOR TOP NATIONS

Despite the importance of security in the virtual world, there are wide variations across nations in the percentage of websites showing a security policy. The US was the nation most likely to show a visible security policy, with 56% of its sites including a statement. This was followed by Australia (54%), Bahamas (33%), Taiwan (22%), Canada (14%), Jamaica (8%), Costa Rica (7%), Ukraine (6%), and Japan (6%). Most other nations did not have sites with a security statement.

PRIVACY FOR TOP NATIONS

Similar to the issue of security, there are widespread variations across the nations in providing privacy policies on their websites. The country with the highest percentage of websites offering a visible privacy policy was St. Lucia (100%), followed by Australia (96%), St. Vincent (88%), the US (81%), Canada (79%) and the Bahamas (33%). Most other countries did not offer privacy statements online.

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Top Countries in Terms of Security Policy

Country	%
US	56
Australia	54
Bahamas	33
Taiwan	22
Canada	14
Jamaica	8
Costa Rica	7
Ukraine	6
Japan	6
All others	0

Top Countries in Terms of Privacy Features

Country	%
St. Lucia	100
Australia	96
St. Vincent	88
US	81
Canada	79
Bahamas	33
Israel	19
Taiwan	17
Sri Lanka	11
New Zealand	8
UK	7
Costa Rica	7
Oman	7
Thailand	6
Japan	6
Singapore	5
Belgium	5
Ireland	5
Turkey	5
All others	0

DISABILITY ACCESS

Disability access is vitally important to citizens who are hearing impaired, visually impaired, or suffer from some other type of handicap. If a site is ill equipped to provide access to individuals with disabilities, it fails in its attempt to reach out to as many people as possible. Some 2% of government websites had some form of disability access using measures that we employed.

In order to be recorded as accessible to the disabled, the site had to display features that would be helpful to the hearing or visually impaired. For example, TTY (Text Telephone) or TDD (Telephonic Device for the Deaf) phone numbers allow hearing-impaired individuals to contact the agency by phone. Second, the site could be "Bobby Approved," meaning that the site has been deemed disability-accessible by a non-profit group that rates internet web sites for such accessibility (http://www.cast.org/bobby/). Third, the site could have web accessibility features consistent with standards mandated by groups such as the World Wide Web Consortium (W3C) or legislative acts of the national government.

DISABILITY ACCESS FOR TOP NATIONS

When looking at disability access in individual countries, it is clear that there is a tremendous variation in the percentage of sites that are accessible. The nations doing the best job on disability access are the US (37% of their sites are accessible), Ireland (24%), Australia (23%), Italy (20%), Madagascar (17%), Jamaica (8%) and South Korea (8%).

Top Disability Access Countries

Country	%
US	37
Ireland	24
Australia	23
Italy	20
Madagascar	17
Jamaica	8
South Korea	8
UK	7
Canada	7
Luxembourg	6
Latvia	6
India	3
All others	0

FOREIGN LANGUAGE ACCESS

As pointed out earlier, about half (45%) of national government websites have foreign language features that allow access to non-native speaking individuals. By foreign language feature, we mean any accommodation to the non-native speakers in a particular country, such as text translation into a different language. There were 46 countries (about one-quarter of the world total) that had bilingual or multi-lingual websites. This included nations such as Estonia, Finland, Libya, Liechtenstein, the Maldives, Moldova, Morocco, and other countries with mixed language populations. Some 80 countries had no language translation on their site other than their native tongue.

ADVERTISEMENTS AND USER FEES

Overall, the use of advertisements to finance government websites is not very widespread. Only 4% of sites had commercial advertisements on their sites, meaning non-governmental corporate and group sponsorships. In general, tourism sites had the most advertisements. For example, these websites had banners or "fly-by" advertisements for hotels, travel agents, or special travel packages.

When defining an advertisement, we eliminated computer software available for free download (such as Adobe Acrobat Reader, Netscape Navigator, and Microsoft Internet Explorer) since they are necessary for viewing or accessing particular products or publications. Links to commercial products or services available for a fee were included as advertisements, as were banner, pop-up and fly-by advertisements.

Examples of advertisements on national government sites included hotel information and booking ("Intimate Hotels" at the Barbados Tourism Authority and "Island Resort Tours" at the Antigua and Barbuda Department of Tourism), a Lycos shopping advertisement on the Algerian Ministry of Finance site, a jobs online banner advertisement on the Afghanistan portal page, "Chez.com" at the Comoros government site, and the Algerian National Meteorology site sponsored by Hilton Hotels.

Countries that had the largest percentage of websites with commercial advertising were Comoros (100% of its sites), Antigua and Barbuda (100%), Uzbekistan (67%), Laos (50%), Brazil (44%), Afghanistan (33%), Tonga (33%), Eritrea (33%), Ukraine (29%), Sierra Leone (25%), Uruguay (25%), Grenada (25%) and Kyrgyzstan (25%).

Furthermore, less than 1% of sites required user fees to access information and services. A growing concern of e-government is that without adequate funding and support, states will increase the use of commercial advertisements and begin charging citizens for the right to access public information in order to generate the necessary revenue. The first creates potential conflicts of interest, while the latter exacerbates the digital divide between rich and poor people in terms of their ability to access the internet. The government that had the highest percentage of websites with user fees was the US (17 %of its sites). Most other countries had no user fees.

PUBLIC OUTREACH

E-government offers the potential to bring citizens closer to their governments. Regardless of the type of political system that a country has, the public benefits from interactive features that facilitate communication between citizens and government. In our examination of national government websites, we looked for various features that would help citizens contact government officials and make use of information on websites.

For example, email is an interactive feature that allows ordinary citizens to pose questions to government officials or request information or services. In our study, we found that 73% of government websites offered email contact material, so that a visitor could email a person in a particular department other than the webmaster.

Percentage of Government Websites Offering Public Outreach

	%
Email	73
Search	38
Comments	8
Email Updates	6
Broadcast	2

While email is certainly the easiest method of contact, there are other methods that government websites can employ to facilitate public feedback. These include areas to post comments (other than via email), the use of message boards and chat rooms. Websites using these features allow citizens and department members alike to read and respond to others' comments regarding issues facing the department. This technology is nowhere near as prevalent as email - only 8% of websites offer this feature.

A total of 38% of the sites we examined had the ability to search that particular website. This is a feature that is helpful to citizens because it allows them to find the specific information they want. Some 2% of sites offer live broadcasts of important speeches or events ranging from live coverage of government hearings and broadcasts of public speeches to weekly internet radio shows featuring various department officials. Some 6% of government websites allow citizens to register to receive updates regarding specific issues. With this feature, web visitors can input their email addresses, street addresses or telephone numbers to receive information about a particular subject as new information becomes available. The information can be in the form of a monthly e-newsletter highlighting a prime minister's views (such as Japanese Prime Minister Junichino Koizumi's successful e-magazine) or in the form of alerts notifying citizens whenever a particular portion of the website has been updated. The specific type of updated material varies from nation to nation.

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TOP E-GOVERNMENT COUNTRIES

In order to see how the 196 nations ranked overall, we created a 0 to 100 point e-government index and applied it to each nation's websites based on the availability of contact information, publications, databases, portals, and number of online services. Four points were awarded to each website for the presence of each of the following 22 features: phone contact information, addresses, publications, databases, links to other sites, audio clips, video clips, foreign language access, not having advertisements, not having user fees, disability access, having privacy policies, security policies, an index, having online services, having a portal connection, allowing digital signatures on transactions, an option to pay via credit cards, email contact information, search capabilities, areas to post comments, broadcasts of events, and option for email updates. These features provided a maximum of 88 points for particular websites.

Each site then qualified for a bonus of six points if it was linked to a portal site, and another six points based on the number of online services executable on that site (1 point for one service, two points for two services, three points for three services, four points for four services, five points for five services, and six points for six or more services). Only 6% of sites linked to a national governmental portal. Some 3% of government websites had two or more services. The e-government index therefore ran along a scale from 0 (having none of these features, no portal, or no online services) to 100 (having all 22 features plus having a portal and at least six online services). This total for each website was averaged across all of a specific country's web sites to produce a 0 to 100 overall rating for that nation.

The top country in our ranking is the US, at 57.2%. This means that every website we analysed for that nation has slightly more than half the features important for information availability, citizen access, portal access and service delivery. Other nations that score well on e-government include Taiwan (52.5%), Australia (50.7%), Canada (49.6%), the UK (47.1%), Ireland (46.9%), Israel (46.2%), Singapore (44.0%), Germany (40.6%) and Finland (40.2%). The Appendix lists e-government scores for each of the 196 countries.

DIFFERENCES BY REGION OF WORLD

There are some differences in e-government by region of the world. Looking at the overall e-government scores by region, North America scores the highest (51.0%), followed by Europe (34%), Asia (34.0%), the Middle East (31.1%), Russia and Central Asia (30.9%), South America (30.7%), Pacific Ocean Islands (30.6%), Central America (27.7%) and Africa (23.5%).

Looking at regional differences in terms of particular feature, North America and Pacific Island nations rank most highly on services, while North America, Asia, South America and Europe score highest on access to publications. Many Pacific Island nations did well on services mainly because of their extensive efforts to promote tourism. The areas with the greatest access to foreign language translation included Russia/Central Asia, Europe, Asia and the Middle East.

Top E-Government Countries

Country	%
US	57.2
Taiwan	52.5
Australia	50.7
Canada	49.6
UK	47.1
Ireland	46.9
Israel	46.2
Singapore	44.0
Germany	40.6
Finland	40.2
France	40.1
Lesotho	40.0
St. Kitts	40.0
Vatican	40.0
Bahamas	39.7
Malaysia	39.0
Iceland	38.3
Belgium	38.0
Bolivia	38.0
Argentina	38.0

CONCLUSIONS

To summarise, we have found that some helpful material has been placed online, but that much more work needs to be undertaken by central governments to upgrade e-government. Aside from publications and links to other sources of information, few countries offer online services, describe their privacy and security policies, or provide any type of disability access. In addition, other than email contact information, many nations have been slow to embrace the interactive features of the internet that facilitate communication between citizens and government agencies. One of the prime virtues of the web is its capacity for interactivity, such as features that put citizens in control of online information. However, most sites do not help citizens tailor information to their particular interests or needs.

In looking towards the future, it is important that all nations create government portals that serve as the gateway to a particular country's websites and offer a "one-stop" web address for online services. A number of countries have adopted portals and put services for citizens, businesses and government agencies in one place. This is a tremendous help to citizens interested in making use of online resources. Portals are

helpful from the citizen standpoint because they offer more uniform, integrated and standardised navigational features. One of the weaknesses of many national websites has been their inconsistency in terms of design features. Government agencies guard their autonomy very carefully, and it has taken a while to get agencies to work together to make the tasks of citizens easier to undertake. Common navigational systems help the average citizen make use of the wealth of material that is online.

Governments need to figure out how to take advantage of features that enhance public accountability. Simple tools such as website search engines are important because such technologies give citizens the power to find the information they want on a particular site. Currently, only one-third of government websites are searchable, which limits the ability of ordinary citizens to find information that is relevant to them.

The same logic applies to features that allow citizens to post comments or otherwise provide feedback about a government agency. Citizens bring diverse perspectives and experiences to e-government, and agencies benefit from citizen suggestions, complaints and feedback. Even a simple feature such as a comment form empowers citizens and gives them an

	North America	Central America	South America	Europe	Russia	Middle East	Africa	Asia	Pacific Ocean
Phone	91	65	75	75	76	54	60	63	85
Address	92	58	69	76	72	47	54	64	83
Publication	98	57	85	81	73	56	51	85	61
Database	83	32	48	40	36	51	21	56	36
Links	68	50	53	45	36	50	19	43	41
Audio Clip	14	2	3	4	2	6	2	3	5
Video Clip	19	2	2	5	2	4	1	6	4
Foreign Lang	49	13	13	66	75	64	13	65	7
Advertisements	1	4	9	3	7	4	2	3	4
User Fees	9	0	0	0	0	0	0	0	0
Index	99	83	92	92	85	91	72	90	66
Privacy	67	10	0	1	0	4	0	2	19
Security	35	1	0	0	1	0	0	2	10
Disability	23	1	0	2	1	0	0	1	4
Services	28	4	3	9	2	10	2	12	21
Link to Portal	38	1	1	8	0	10	0	13	1
Credit Cards	16	1	0	1	0	1	0	0	3
Digital Sign	1	0	0	0	0	0	0	1	0
Email	83	69	87	78	77	72	60	70	81
Search	82	21	34	54	34	31	19	30	60
Comment	11	5	5	6	10	12	4	16	10
Broadcast	7	1	1	2	0	2	0	2	3
Updates	31	4	3	6	3	4	1	6	12
English	89	60	14	76	72	77	67	85	100

opportunity to voice their opinion about the government services they would like to see.

The issue of how to pay for portals and other e-government costs remains a pressing challenge for almost every country. The start-up costs of e-government are extensive, and small or poor countries have difficulty reaching the economies of scale necessary to pay for the technology.

While a few sites employ commercial advertising or user fees for their public-sector sites right now, there still are risks either in commercialising e-government or relying on user fees. The former creates potential conflicts of interest for government agencies if their websites become dependent on commercial revenue; the latter disenfranchises people of more limited means and widens the digital divide between rich and poor. Our view is that e-government is a valuable part of the public sector and needs to be supported with tax dollars. In the long run, a flourishing e-government offers the potential for improved service delivery with enhanced accountability.

Clearly, one major problem of e-government is the up-front cost of developing a website and putting information and services online. Right now, many nations appear to be undertaking these tasks in isolation from other nations, thereby robbing each country of the opportunity to achieve economies of scale that would lower the per unit cost of e-government websites.

Smaller and poorer countries should undertake regional e-government alliances that would allow them to pool resources and gain greater efficiency at building their infrastructure.

One example of this kind of alliance is "IslamWeb". This is a site (www.islamweb.net) that puts information online that is of mutual interest to Islamic nations. It gives citizens interested in this topic one place to find information that cuts across individual nations. At the same time, such a site also offers economies of scale to specific countries in placing cultural and religious material on the internet. These efforts at regional co-operation are valuable because they put countries in a position where they can share knowledge and expertise, as well as lower their overall costs.

Furthermore, countries should undertake steps that allow for online credit card transactions and digital signatures. It will be difficult to extend some services online without there being some means by which citizens can transfer funds electronically via the website.

They also need more visible phone numbers and more frequent updates of the government site. Some websites appeared as if they had not been updated in several years, with the result being that information on the web is seriously outdated. If countries both update and place more material online, it would encourage citizens to make greater use of e-government resources. ■

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APPENDIX

Note: The following table shows e-government rank orderings for the 196 countries.

Table A-1 Complete E-Government Rankings by Country

Country	%	Country	%	Country	%
US	57.2	Greece	34.2	Barbados	30.6
Taiwan	52.5	South Africa	34.2	Ethiopia	30.5
Australia	50.7	Bosnia	34.1	Ukraine	30.4
Canada	49.6	Brazil	33.8	Turkey	30.3
UK	47.1	Latvia	33.8	China	30.2
Ireland	46.9	Iran	33.4	Tajikistan	30.0
Israel	46.2	St. Vincent	33.4	Vanuatu	30.0
Singapore	43.4	South Korea	33.4	DR Congo	30.0
Germany	40.6	Mexico	33.1	Lao PDR	30.0
Finland	40.2	Egypt	33.0	Indonesia	30.0
France	40.1	Hungary	33.0	Sri Lanka	29.8
Lesotho	40.0	Spain	32.8	Macedonia (FYR)	29.7
St. Kitts	40.0	Philippines	32.8	Cambodia	29.6
Vatican	40.0	Vietnam	32.8	Cook Islands	29.5
Bahamas	39.7	Georgia	32.7	Sweden	29.4
Malaysia	39.0	Nepal	32.7	Mauritius	29.4
Iceland	38.3	Brunei	32.7	Monaco	29.3
Belgium	38.0	Chile	32.6	Oman	29.1
Bolivia	38.0	Netherlands	32.6	Paraguay	29.0
Argentina	38.0	Croatia	32.6	Pakistan	28.8
Italy	37.8	Maldives	32.5	Algeria	28.7
Switzerland	37.7	Russia	32.5	Kuwait	28.7
Slovenia	37.6	Jamaica	32.3	Bangladesh	28.5
St. Lucia	37.0	Mongolia	32.3	Panama	28.4
Denmark	37.0	Libya	32.0	Uruguay	28.4
New Zealand	36.8	Poland	32.0	Jordan	28.1
Saudi Arabia	36.8	Slovakia	32.0	Malawi	28.0
Austria	36.8	Djibouti	32.0	Micronesia	28.0
Norway	36.5	Antigua	32.0	Palau	28.0
Estonia	36.2	India	31.8	Samoa	28.0
Peru	36.1	Lebanon	31.3	Turkmenistan	28.0
Mauritania	36.0	Thailand	30.8	Bhutan	28.0
Morocco	36.0	Cyprus-Republic	30.8	Guatemala	28.0
Luxembourg	35.9	Guyana	30.8	San Marino	27.7
El Salvador	35.6	Romania	30.7	Nicaragua	27.7
Armenia	35.3	Rwanda	30.7	Seychelles	27.6
Lithuania	35.1	Albania	30.7	Malta	27.6
Japan	34.9	Ecuador	30.7	Honduras	27.3
Bulgaria	34.5	Costa Rica	30.6	Dominican Republic	27.2

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Table A-1 Complete E-Government Rankings by Country (continued)

Country	%	Country	%	Country	%
Sierra Leone	27.0	Cape Verde	24.0	Yugoslavia (FR)	19.7
Myanmar	26.8	Iraq	24.0	Burkina Faso	19.6
Yemen	26.7	North Korea	24.0	Gambia	19.5
Eritrea	26.7	Tunisia	23.8	Niger	18.7
Kenya	26.7	Belize	23.8	Marshall Islands	18.6
Liechtenstein	26.6	Sudan	23.0	Benin	18.6
Angola	26.4	Gabon	22.7	Tanzania	17.6
Bahrain	26.2	Zambia	22.5	Portugal	17.5
Belarus	26.2	Cameroon	22.2	Liberia	17.3
United Arab Emirates	26.1	Sao Tome	22.0	Swaziland	16.2
Czech Republic	26.1	Moldova	21.6	Afghanistan	16.0
Ghana	26.1	Papua New Guinea	21.6	Mozambique	16.0
Madagascar	26.0	Tonga	21.3	Zimbabwe	16.0
Namibia	26.0	Azerbaijan	20.5	Central African Republic	16.0
Senegal	26.0	Uganda	20.5	Equatorial Guinea	16.0
Suriname	26.0	Mali	20.0	Nigeria	15.2
Togo	26.0	Somalia	20.0	Burundi	14.6
Grenada	26.0	Uzbekistan	20.0	Haiti	13.0
Kyrgyzstan	26.0	Chad	20.0	Qatar	12.8
Colombia	25.7	Andorra	20.0	Somalia	12.4
Botswana	25.3	Comoros	20.0	Guinea	12.3
Cuba	24.6	Cote d'Ivoire	20.0	Nauru	12.0
Fiji	24.4	Cyprus (Turkish Rep)	20.0	Dominica	12.0
Trinidad	24.4	Kazakhstan	20.0	Venezuela	9.3
Niue	24.0	Kiribati	20.0	Congo-Brazzaville	8.0
Syria	24.0	Solomon Islands	19.8	Guinea-Bissau	8.0
Tuvalu	24.0				

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APPENDIX

Note: The following table shows the percentage of websites in each country that have each feature, such as online services, publications, and databases.

Table A-2 Individual Country Profiles for Selected Features

	Online Services	Publications	Data bases	Privacy Policy	Security Policy	Handicap Accessibility
Afghanistan	0%	33%	0%	0%	0%	0%
Albania	0	78	33	0	0	0
Algeria	0	76	65	0	0	0
Andorra	0	60	20	0	0	0
Angola	0	40	60	0	0	0
Antigua	0	100	0	0	0	0
Argentina	0	81	38	0	0	0
Armenia	10	90	50	0	0	0
Australia	50	100	85	96	54	23
Austria	15	93	36	0	0	0
Azerbaijan	7	40	20	0	0	0
Bahamas	33	67	67	33	33	0
Bahrain	11	32	58	0	0	0
Bangladesh	6	59	41	0	0	0
Barbados	20	40	40	0	0	0
Belarus	0	47	33	0	0	0
Belgium	11	95	21	5	0	0
Belize	0	65	12	0	0	0
Benin	0	18	9	0	0	0
Bhutan	0	0	0	0	0	0
Bolivia	0	100	50	0	0	0
Bosnia	0	7	100	0	0	0
Botswana	0	100	0	0	0	0
Brazil	6	100	50	0	0	0
Brunei	0	100	100	0	0	0
Bulgaria	0	100	23	0	0	0
Burkina Faso	0	60	20	0	0	0
Burundi	0	36	18	0	0	0
Cambodia	13	50	50	0	0	0
Cameroon	0	44	33	0	0	0
Canada	34	100	72	79	14	7
Cape Verde	0	100	0	0	0	0
Central African Republic	0	0	0	0	0	0
Chad	0	0	0	0	0	0
Chile	12	100	59	0	0	0
China	26	70	30	0	0	0
Colombia	0	74	42	0	0	0

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Table A-2 Individual Country Profiles for Selected Features (continued)

	Online Services	Publications	Data bases	Privacy Policy	Security Policy	Handicap Accessibility
Comoros	0	100	100	0	0	0
Congo-Brazzaville	0	0	0	0	0	0
Cook Islands	50	50	25	0	0	0
Costa Rica	7	93	57	7	7	0
Cote d'Ivoire	0	75	50	0	0	0
Croatia	0	81	48	0	0	0
Cuba	3	42	35	0	0	0
Cyprus-Rep	0	54	54	0	0	0
Cyprus-Turk	0	0	100	0	0	0
Czech Rep	0	50	17	0	0	0
Denmark	12	92	58	0	0	0
Djibouti	0	100	0	0	0	0
Dominica	0	0	0	0	0	0
Dominican Rep	4	71	33	0	0	0
DR Congo	0	100	0	0	0	0
Ecuador	0	89	44	0	0	0
Egypt	5	74	42	0	0	0
El Salvador	0	100	89	0	0	0
Eq Guinea	0	0	0	0	0	0
Eritrea	0	33	0	0	0	0
Estonia	0	84	32	0	0	0
Ethiopia	0	63	38	0	0	0
Fiji	3	10	3	0	0	0
Finland	0	100	76	0	0	0
France	25	100	63	0	0	0
Gabon	0	67	33	0	0	0
Gambia	0	38	13	0	0	0
Georgia	0	82	55	0	0	0
Germany	59	88	56	0	0	0
Ghana	6	72	50	0	0	0
Greece	0	100	18	0	0	0
Grenada	0	0	0	0	0	0
Guatemala	0	92	25	0	0	0
Guinea	0	15	8	0	0	0
Guinea-Bissau	0	0	0	0	0	0
Guyana	0	85	46	0	0	0
Haiti	11	44	11	0	0	0
Honduras	0	67	0	0	0	0
Hungary	0	94	41	0	0	0
Iceland	6	100	22	0	0	0
India	7	97	40	0	0	3
Indonesia	4	87	52	0	0	0

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Table A-2 Individual Country Profiles for Selected Features (continued)

	Online Services	Publications	Data bases	Privacy Policy	Security Policy	Handicap Accessibility
Iran	8	67	50	0	0	0
Iraq	0	100	0	0	0	0
Ireland	14	100	43	5	0	24
Israel	27	96	65	19	0	0
Italy	10	100	75	0	0	20
Jamaica	25	83	25	0	8	8
Japan	0	94	72	6	6	0
Jordan	6	44	44	0	0	0
Kazakhstan	0	100	0	0	0	0
Kenya	0	33	33	0	0	0
Kiribati	0	0	100	0	0	0
Korea, North	0	100	0	0	0	0
Korea, South	8	92	60	0	0	8
Kuwait	0	50	50	0	0	0
Kyrgyzstan	0	75	25	0	0	0
Lao PDR	0	100	50	0	0	0
Latvia	0	72	28	0	0	6
Lebanon	14	86	50	0	0	0
Lesotho	0	100	0	0	0	0
Liberia	0	67	33	0	0	0
Libya	0	100	0	0	0	0
Liechtenstein	20	0	0	0	0	0
Lithuania	7	80	60	0	0	0
Luxembourg	13	94	38	0	0	6
Macedonia (FYR)	0	76	29	0	0	0
Madagascar	0	50	0	0	0	17
Malawi	0	50	100	0	0	0
Malaysia	16	84	48	0	0	0
Maldives	0	81	69	0	0	0
Mali	0	67	0	0	0	0
Malta	6	38	6	0	0	0
Marshall Islands	0	7	50	0	0	0
Mauritania	0	100	0	0	0	0
Mauritius	0	92	31	0	0	0
Mexico	0	94	78	0	0	0
Micronesia	0	50	0	0	0	0
Moldova	0	60	20	0	0	0
Monaco	0	67	33	0	0	0
Mongolia	0	87	53	0	0	0
Morocco	0	100	0	0	0	0
Mozambique	0	0	50	0	0	0
Myanmar	0	70	90	0	0	0

Continued

Table A-2 Individual Country Profiles for Selected Features (continued)

	Online Services	Publications	Data bases	Privacy Policy	Security Policy	Handicap Accessibility
Namibia	0	50	25	0	0	0
Nauru	0	0	0	0	0	0
Nepal	0	83	67	0	0	0
Netherlands	7	87	40	0	0	0
New Zealand	48	100	48	8	0	0
Nicaragua	0	83	33	0	0	0
Niger	0	67	0	0	0	0
Nigeria	0	40	0	0	0	0
Niue	0	100	100	0	0	0
Norway	5	100	53	0	0	0
Oman	7	47	27	7	0	0
Pakistan	0	73	40	0	0	0
Palau	0	0	0	0	0	0
Panama	0	90	70	0	0	0
Papua New Guinea	9	45	27	0	0	0
Paraguay	0	83	67	0	0	0
Peru	7	100	67	0	0	0
Philippines	6	100	56	0	0	0
Poland	0	95	42	0	0	0
Portugal	0	38	8	0	0	0
Qatar	0	20	20	0	0	0
Romania	9	100	18	0	0	0
Russia	0	92	33	0	0	0
Rwanda	0	100	33	0	0	0
Sao Tome	0	100	0	0	0	0
St. Kitts/Nevis	0	100	100	0	0	0
St. Lucia	0	75	0	100	0	0
St. Vincent	0	29	24	88	0	0
Samoa	0	0	0	0	0	0
San Marino	14	29	14	0	0	0
Saudi Arabia	11	78	67	0	0	0
Senegal	0	67	50	0	0	0
Seychelles	40	60	60	0	0	0
Sierra Leone	0	100	0	0	0	0
Singapore	47	95	53	5	0	0
Slovakia	0	100	0	0	0	0
Slovenia	0	90	40	0	0	0
Solomon Islands	0	18	6	0	0	0
Somalia	0	0	0	0	0	0
Somaliland	0	50	50	0	0	0
South Africa	13	100	33	0	0	0
Spain	17	100	61	0	0	0

Continued

Table A-2 Individual Country Profiles for Selected Features (continued)

	Online Services	Publications	Data bases	Privacy Policy	Security Policy	Handicap Accessibility
Sri Lanka	0	56	44	11	0	0
Sudan	0	63	25	0	0	0
Suriname	0	50	0	0	0	0
Swaziland	0	4	0	0	0	0
Sweden	8	75	0	0	0	0
Switzerland	15	100	23	0	0	0
Syria	0	67	33	0	0	0
Taiwan	65	100	87	17	22	0
Tajikistan	0	50	50	0	0	0
Tanzania	0	13	4	0	0	0
Thailand	0	100	41	6	0	0
Togo	0	50	0	0	0	0
Tonga	0	0	0	0	0	0
Trinidad	0	11	6	0	0	0
Tunisia	0	4	8	0	0	0
Turkey	9	27	59	5	0	0
Turkmenistan	0	0	0	0	0	0
Tuvalu	0	100	0	0	0	0
Uganda	0	25	19	0	0	0
UK	30	100	67	7	0	7
Ukraine	0	71	53	0	6	0
United Arab Emirates	7	43	50	0	0	0
US	34	98	90	81	56	37
Uruguay	0	85	45	0	0	0
Uzbekistan	0	33	0	0	0	0
Vanuatu	0	100	0	0	0	0
Vatican	0	100	0	0	0	0
Venezuela	0	17	0	0	0	0
Vietnam	0	100	20	0	0	0
Yemen	0	67	50	0	0	0
Yugoslavia (FR)	0	62	23	0	0	0
Zambia	0	58	0	0	0	0
Zimbabwe	0	50	25	0	0	0